

Chemistry I: Nomenclature Summary Sheet

Binary Compounds (2 elements)

Metal and nonmetal

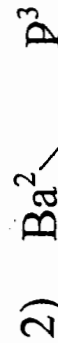
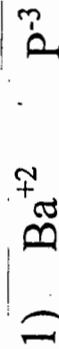
Fixed charges.

Write name from formula

1. Name first element
2. Name second element
3. Use the root of the name and add **-ide**
4. Examples:
 - a. NaCl sodium chloride
 - b. CaCl₂ calcium chloride

Write formula from name

1. Write the symbol and charge of the metal
2. Write the symbol and charge of the nonmetal
3. Drop the signs and criss-cross the numbers to create subscripts
4. Reduce to simplest whole number ratio if needed
5. Example: barium phosphide



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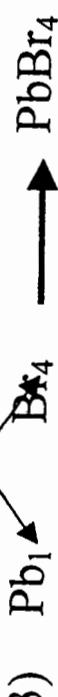
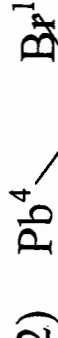
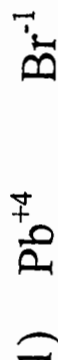
Variable charges: Stock system

Write name from formula

1. Name the first element
2. Assign the oxidation number (charge) to the metal
3. Convert the metal charge to a Roman numeral
4. Use the root of the 2nd element name and add **-ide**
5. Examples:
 - a. CuS Cu⁺²S⁻² copper (II) sulfide
 - b. Fe₂S₃ Fe⁺³S⁻² iron (III) sulfide

Write formula from name

1. Write the symbol and charge of the metal
The Roman numeral is the charge on the metal
2. Write the symbol and charge of the nonmetal
3. Drop the signs and cross the numbers to create subscripts
4. Reduce to simplest whole number ratio if needed
5. Example: lead (IV) bromide



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Variable charges: Common (Old) names

Write name from formula

1. Find the total charge brought to the formulas by the nonmetal
2. Find the total charge brought to the formula by the metal. Divide the total positive charge by the number of atoms of metal.
3. Check to be sure the charge is possible for this metal
4. Name the root of the metal and add **-ic** or **-ous**.

- a. **-ous** is the lower oxidation number
- b. **-ic** is the higher oxidation number

5. Example:



Sulfur brings a **-2** charge as the sulfide ion

The means the copper must be **+2** to make this zero charge

Now divide the **+2** by the number of atoms of copper (2)

So, this copper (I) sulfide

Binary Compounds (2 elements)
Metal and nonmetal

Variable charges: Common (Old) names

Write formula from name

1. Identify the metal and charge from the 1st part of the name
2. Write the metal symbol and the charge
3. Identify the nonmetal ion and the charge
4. Write the nonmetal symbol and the charge
5. Drop the sign and criss-cross the numbers to make subscripts

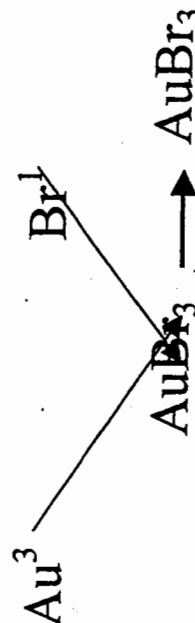
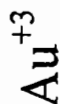
Reminder:

ous is the lower oxidation number

ic is the higher oxidation number

6. Example:

auric bromide



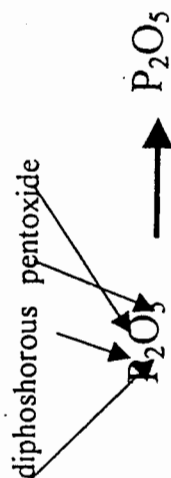
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Binary Compounds (2 elements)

Nonmetal/nonmetal: these are molecular compounds or are molecules
Greek System: the prefixes tell you how many atoms of an element make up the molecule. *NO reduction of subscripts is needed.*

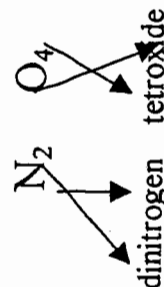
Write the formula from the name

1. Determine the number of atoms of the first element by the prefix.
2. Determine the symbol of the first element
3. Write the symbol of the 1st element and use the prefix number as the subscript
4. Determine the number of atoms of the second element by the prefix.
5. Determine the symbol of the second element
6. Write the symbol of the 2nd element and use the prefix number as the subscript
7. Example:



Write the name from the formula

1. Determine the number of atoms of the first element by the subscript
2. Determine the name of the first element from the symbol
3. Write the prefix from the subscript and the name 1st element
4. Determine the number of atoms of the second element by the subscript
5. Determine the name of the second element:
6. Write the prefixed the 2nd element and root name plus -ide
7. example:



Compounds with polyatomic ions
metal/ polyatomic ion

polyatomic ions are covalently bonded
When there is more than one polyatomic

parenthesis are used since they stay together

Write the formula from the name

1. Name the metal and determine the charge on the metal (see oxidation # rules)
2. Use either the Stock or Greek name for the metal (see what the question asks) **If the metal has only 1 charge just name the metal**
3. name the polyatomic ion (see reference sheet)
- 4 Example:



2 nitrate ions bring a total of -2 charge
the metal(iron0 must bring a +2

therefore, the name is iron (II) nitrate or ferrous nitrate

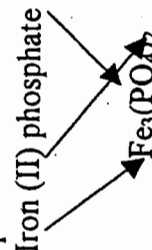
Write the formula from the name

1. Write the symbol and charge of the metal
2. Write the symbol and charge of the polyatomic ion
3. Drop the charges and criss-cross the numbers to make subscripts

TREAT THE POLYATOMIC AS ONE THING

Use parenthesis where needed

4. Example:



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Things you need to memorize:

<p>Common names of these metals with variable charges:</p> <table><tr><td>Copper</td><td>Cu^{+1} Cu^{+2}</td><td>cuprous cupric</td></tr><tr><td>Iron</td><td>Fe^{+2} Fe^{+3}</td><td>ferrous ferric</td></tr><tr><td>Lead</td><td>Pb^{+2} Pb^{+4}</td><td>plumbous plumbic</td></tr><tr><td>Tin</td><td>Sn^{+2} Sn^{+4}</td><td>stannous stannic</td></tr></table>	Copper	Cu^{+1} Cu^{+2}	cuprous cupric	Iron	Fe^{+2} Fe^{+3}	ferrous ferric	Lead	Pb^{+2} Pb^{+4}	plumbous plumbic	Tin	Sn^{+2} Sn^{+4}	stannous stannic	<p>These common polyatomic ions</p> <table><tr><td>NO_3^{-1}</td><td>nitrate</td></tr><tr><td>NO_2^{-1}</td><td>nitrite</td></tr><tr><td>OH^{-1}</td><td>hydroxide</td></tr><tr><td>CO_3^{-2}</td><td>carbonate</td></tr><tr><td>SO_4^{-2}</td><td>sulfate</td></tr><tr><td>SO_3^{-2}</td><td>sulfite</td></tr><tr><td>PO_4^{-3}</td><td>phosphate</td></tr><tr><td>ClO^{-1}</td><td>hypochlorite</td></tr><tr><td>HCO_3^{-1}</td><td>hydrogen carbonate (bicarbonate)</td></tr><tr><td>$\text{C}_2\text{H}_3\text{O}_2^{-1}$</td><td>acetate</td></tr><tr><td>NH_4^{+1}</td><td>ammonium</td></tr></table>	NO_3^{-1}	nitrate	NO_2^{-1}	nitrite	OH^{-1}	hydroxide	CO_3^{-2}	carbonate	SO_4^{-2}	sulfate	SO_3^{-2}	sulfite	PO_4^{-3}	phosphate	ClO^{-1}	hypochlorite	HCO_3^{-1}	hydrogen carbonate (bicarbonate)	$\text{C}_2\text{H}_3\text{O}_2^{-1}$	acetate	NH_4^{+1}	ammonium
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<p>These Greek prefixes</p> <table><tr><td>mono-</td><td>one</td></tr><tr><td>di</td><td>two</td></tr><tr><td>tri-</td><td>three</td></tr><tr><td>tetra-</td><td>four</td></tr><tr><td>penta-</td><td>five</td></tr><tr><td>hexa-</td><td>six</td></tr><tr><td>hepta</td><td>seven</td></tr><tr><td>octa</td><td>eight</td></tr></table>	mono-	one	di	two	tri-	three	tetra-	four	penta-	five	hexa-	six	hepta	seven	octa	eight	<p>Notes:</p> <p>Do not reduce molecular formulas (nonmetals/nonmetals) Do not reduce the formulas of mercury compounds The prefix bi- on a polyatomic ion name means H is present.</p>																		
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